

Powder Metallurgy

USSR

UDC: 621.77.2

ZHIVOV, L. I., PAVLYV, V. A., SHCHERBINA, V. V., KOLESNIK, F. I. and  
BAKOGON, V. N., Zaporozh'ye Machine Building Institute

"Conditions for Hot Extrusion of Rods From Cermet Titanium"

Kiev, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

Abstract: Rods and shapes of intricate cross sections with a density close to monolithic metal may be produced from pre-compressed titanium powder briquettes with the use of appropriate equipment and the knowledge of the power energy parameters of hot extrusion (including force and work of deformation). Characteristic of hot forming of powdered metals and specifically of titanium powder is the fact that the density of the briquette in the first (nonstationary) phase of extrusion is lower than that of monolithic metal. In the second, quasi-stationary region, the densities of both the cake and the finished product are commensurate and approach that of monolithic metal. The stress-deformation relationship characteristic of a solid metal may be applied with reasonable accuracy to powdered materials. Considered here is the hot extrusion of pure titanium

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ZHIVOV, L. I., et al, Poroshkovaya metallurgiya, No 11, Nov 71, pp 16-21

powders and those alloyed with tungsten carbide (up to 30%). Use is made of correction coefficients for crank press tests to correlate the data on stresses and deformations by simple mathematical relationships. A romograph is proposed for rapid determination of both specific and over-all stresses of extrusion of cermet materials. (5 illustrations, 1 table, 2 bibliographic references).

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USSR

UDC 539.67

TEPLOV, V. A., MALYSHEV, K. A., and PAVLOV, V. A.

"Measurement of the Amplitude Dependence of Internal Friction in an Alloy With a Thermoelastic Martensite"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 156-159

Abstract: Results are presented of measurements of the internal friction in Cu-14.5%, Al-3.4%, Ni and Ti-54.5% in the range of  $1-20 \times 10^{-4}$  amplitudes. It is shown, that high internal friction in alloys is governed by motion of the interphase boundary under a variable load and by variation of a thin, twinning martensite structure.

The variation of slope of the internal friction amplitude dependence characteristic is explained by a saturation of inelastic processes, generating high friction. 3 figures, 13 references.

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USSR

UD0 621.385.623.4

BRODULENKO, I.I., PAVLOV, V.A.

"Concerning The Effect Of The Feedback Factor On The Power And Efficiency Of A Low-Power Transit Oscillating Klystron"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, No 7, pp 25-31  
(from RZh--Elektronika i yeye primeneniye, No 11, November 1970, Abstract No 11A127)

Translation: On the basis of kinematic theory, the effect is investigated of the feed-back factor on the power and efficiency of a two-cavity transit oscillating klystron. The results of the analysis are given in the form of simple formulas, expressions, and graphics, which give a clear idea of the dependence of the power and efficiency of the klystron on the feedback factor and other parameters, and also of the maximum possible values of the efficiency. 4 ref. Author's summary.

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Transformation and Structure

USSR

UDC 620.187

VIL'DANOVA, N. F., NOSKOVA, N. I., PAVLOV, V. A., BELOUSOV, N. N., and  
MIKHEYEVA, Ye, N., Institute of Metal Physics, Academy of Sciences USSR

"Electron Microscope Study of Al-Mg Alloys Cooled With Varying Rates From  
the Homogenization Temperature"

Sverdlovsk, Fizika Metallov i Metallovedeniye, No 6, Vol 30, Dec 70, pp 1264-  
1269

Abstract: Changes were investigated in the structure of alloys Al+Mg(11%)  
and Al+Mg(11%)+Ti, Zr, Be, Mn (0.1%) which result in connection with the use  
of different cooling rates after a homogenizing anneal. The cast and heat-  
treated alloys were rolled into plates measuring 20 x 50 x 0.2 mm and then  
subjected to a homogenizing anneal at 435° C for 20 hours with different  
cooling rates: quenched in cold water (+20), quenched in hot water (+90),  
and air cooled.

Thin foils of the alloys were investigated by electron microscopy. The foils  
were made from plates, which had been heat treated, by chemically thinning  
them in a 40% solution of sodium hydroxide with subsequent electropolishing  
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VIL'DANOVA, N. F., et al, Fizika Metallov i Metallovedeniye, No 6, Vol 30,  
Dec 70, pp 1264-1269

in an electrolyte at +70 C. The investigation was conducted with an SEM-3  
microscope.

It was shown that aging processes take place in these alloys independently  
of the cooling rate and grains are detected in the structure along the  
boundaries and in the volume of which there are precipitations. Complex  
alloying accelerates aging: in the structure of the alloy after cooling  
at the maximum rate practically no grains were observed without precipi-  
tates, but coagulation of the precipitated phases takes place. A decrease  
in the cooling rate leads to a fuller passage of aging processes and to  
phase coagulation in all the alloys.

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USSR

PAVLOV, V. A., VANYUKOV, S. A., and KUDRYASHOV, G. N.

"The Influence of Aerodynamic Drag Forces on Gyroscope Drift in the Event of Skewness of the Principal Axis"

Tr. Leningr. in-t aviats. priborost. (Works of Leningrad Institute of Aviation Instrument Manufacture), 1970, vyp. 66, pp 170-173 (from RZh-Mekhanika, No 1, Jan 71, Abstract No 1A87 by S. S. Rivkin)

Translation: The article presents results of an experimental verification of the appearance of systematic drift of a two-degree-of-freedom astatic gyroscope around the outer axis of suspension, caused by aerodynamic drag forces in the event of a skewed principal axis. An expression is given for the moment of aerodynamic drag forces appearing during rotation of the rotor, and its physical nature is ascertained. It is shown that the component of this moment along the axis of rotation of the inner gimbal ring, which appears if the principal axis of the gyroscope is skewed, gives rise to azimuthal gyroscope drift. An expression is given for the angular velocity of this drift. A description is given of the mock-up for laboratory verification of the gyroscope drift. An account is given of the nature

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USSR

PAVLOV, V. A., et al., Tr. Leningr. in-t aviats. priborost. (Works of Leningrad Institute of Aviation Instrument Manufacture), 1970, vyp. 66, pp 170-173 (from RZh-Mekhanika, No 1, Jan 71, Abstract No 1A87 by S. S. Rivkin)

of the procedure for conducting the experiment. Results of experimental verification and calculation of the angular velocity of gyroscope drift are given in a table. A graph of calculated and measured gyroscope drift values is plotted according to the data of this table. It is shown that experimental results agree rather well with calculated data.

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1/2 036 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--PRESSING OF COPPER BORON NITRIDE TUBES -U-  
AUTHOR--(03)-ZHIVOV, L.I., SKUSNYAKOV, YU.N., PAVLOV, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--POROSHKOVAYA MET., JAN. 1970, (1), 92-97  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--BORON NITRIDE, COPPER, CERMET, REFRACTORY COMPOUND, CERAMIC  
PROCESSING, CERAMIC PRESSING, DEFORMATION RATE, COPPER TUBE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FREAME--1090/1287 STEP NO--0870226/70/0001/0002/0007  
CIRC ACCESSION NO--AP0109371  
UNCLASSIFIED

2/2 036

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NJ--AP0109371

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GENERAL PRINCIPLES UNDERLYING THE HOT PRESSING OF HOLLOW TUBULAR ELECTRODES FROM CU-BN CERMETS ARE DISCUSSED. SPECIAL ATTENTION IS REQUIRED IN RELATION TO OPTIMIZATION OF THE PRESSING PARAMETERS (APPLIED STRESS, RATE OF DEFORMATION, ETC.). THE APPLIED PRESSURE IS PARTLY GOVERNED BY THE DESIRED WALL THICKNESS OF THE TUBE; TYPICAL CASES INVOLVE TUBES OF DIA. 10-20 AND WALL THICKNESSES 1-8 MM. SUBJECT TO PROPER CONDITIONS THE CU COMPONENT OF THE TUBULAR ELECTRODES IS PROTECTED FROM ELECTRICAL DAMAGE (IN PULSE DISCHARGES) BY THE REFRACTORY BN COMPONENT. G. A.

UNCLASSIFIED

Mechanical Properties

USSR

UDC 669.35'71'24:534.283

TEPLOV, V. A., MALYSHEV, K. A., PAVLOV, V. A.

"Damping in Copper-Aluminum-Nickel Alloys and Its Causes"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 34, No 1, Jul 72, pp 166-177.

Abstract: The damping properties of Cu-Al-Ni alloys containing 9.18 to 14.45 wt.% Al and from 0.95 to 6.5 wt.% Ni were determined on a pendulum test machine. The alloys have high specific damping capacity -- from 15 to 75%. Damping is explained by losses in the energy of mechanical oscillations as the boundaries of twin-like bands and interphase boundaries move. In certain cases, these materials can be used as structural damping materials. Alloys containing from 9 to 13.2% Al and about 2.4% Ni have good damping and acceptable mechanical properties.

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PAVLOV, V.F.

SPS 59068  
6-12

III-2. STUDY OF THE EFFECT OF THE DEVIATION OF THE COMPOSITION FROM THE STOICHIOMETRY AND THE CRYSTALLOGRAPHIC DIRECTION OF GROWTH ON THE DISLOCATION STRUCTURE OF SINGLE BARIUM ARSENIDE CRYSTALS

Article by S. P. Grizhina, M. G. Mil'vidskiy, V. B. Osvenetskiy, V. F. Pavlov, V. G. Ponomarev, Moscow; Novosibirsk, III Symposium on Problems of Crystallography, Poluprovodnikov, K. Feofilov & Plensk, Nurnan, 12-17 June, 1972, p. 26

It was demonstrated that during the growth from a melt, the deviation of the composition from the stoichiometry can have an effect on the dislocation structure of barium arsenide single crystals both through the crystallization process and by creating additional dislocation sources in the material which has already been crystallized. In the first case the deviation of the composition of the melt from stoichiometry can lead to destruction of the stability of the smooth crystallization front under the conditions of concentration supercooling which is expressed in the formation of the low-angle boundaries and the cellular structure. This effect is exhibited most clearly when growing a crystal in the [100] direction and with a small magnitude of the axial temperature gradient at the crystallization front. In the second case the deviation of the composition from stoichiometry has an effect on the formation of the dislocations in the crystal under the effect of thermal stresses. It was established that the deviation from stoichiometry in the direction of excess gallium in the surface layers of the crystal leads to more intense formation of the dislocations where the deviation in the direction of the excess arsenic has the opposite effect; by comparison with the stoichiometric composition, for growth under conditions of identical stoichiometry of the melt, a noticeable effect of the arsenic direction on the dislocation density in the crystal was not observed. This is confirmed by the results of calculating the thermal stresses field. Using the x-ray diffraction topography, a study was made of the types of dislocations in the single crystals expressed in various crystallographic directions.

1/2 027 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--DISCRETENESS OF THE FIELD DISTRIBUTION OF THE INTENSITY OF THE  
BARKHAUSEN EFFECT OF YTTRIUM FERRITE -U-  
AUTHOR--(03)--PAVLOV, V.F., RYABINKIN, L.N., SMOLIN, R.P.

COUNTRY OF INFO--USSR

SOURCE--ZH. TEKH. FIZ. 1970, 40(4), 859-61

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., EARTH SCIENCES AND  
OCEANOGRAPHY, PHYSICS  
TOPIC TAGS--YTTRIUM COMPOUND, FERRITE, SINGLE CRYSTAL, GARNET, MAGNETIC  
PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAHE--2000/0282

STEP NO--UR/0057/70/040/004/0859/0861

CIRC ACCESSION NO--AP0124041

UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124041

ABSTRACT/EXTRACT--(U) GP-Q- ABSTRACT. THE DISTRIBUTION OF THE NO. OF JUMPS IN THE INTENSITY ALONG THE FIELD WAS DETD. FOR Y FE GARNET SINGLE CRYSTAL. THE DISCRETE NATURE OF THE DISTRIBUTION CURVES SUPPORTS THE GROUP ORIGIN OF THE JUMPS DURING MAGNETIC REVERSAL. THE NATURE OF THE DISTRIBUTION IS VERY STABLE, WHICH IS ATTRIBUTED TO THE STABILITY OF THE DYNAMICS FOR THE MAGNETIC STRUCTURES DURING REPEATED REVERSALS. THE EXISTENCE OF RESOLN. LIMITS WITH RESPECT TO THE FIELD, ABOVE WHICH THE FORM OF THE DISTRIBUTION CURVE REMAINS UNCHANGED, INDICATES THE LIMITATIONS OF THE METHOD OF TAKING THE CURVES IN A SLOWLY CHANGING FIELD. FACILITY: INST. FIZ., KRASNOYARSK, USSR.

UNCLASSIFIED

Acc. Nr.

AP0113203

Abstracting Service:  
CHEMICAL ABST.

6/10

Ref. Code

UR0072

135906g Influence of lithium oxide, sodium oxide, and potassium oxide additives on phase transformations taking place during the firing of clays of various mineralogical compositions. Pavlov, V. F.; Bystrykov, A. S.; Andreeva, N. I. (USSR). *Steklo Keram.* 1970, 27(2), 38-40 (Russ). The results of investigating the effect of  $\text{Li}_2\text{O}$ ,  $\text{Na}_2\text{O}$ , and  $\text{K}_2\text{O}$  on phase transformations of clays are given. These addns. were introduced in 2% amts. The samples were fired in a shielded Silite furnace at a temp. of 1050-1300°, whereupon they were cooled in the furnace. The fired samples were investigated by x-ray diffraction with a URS-50I instrument and Cu-radiation (Ni-filter). Samples of rock kaolinite clay without addns. consist of an amorphous phase and quartz. Addn. of  $\text{Li}_2\text{O}$  produces intensification of the process of crystn. of mullite and cristobalite. The  $\text{Na}_2\text{O}$  addn. has a similar effect, except to a lesser degree. Similar results are obtained for clays of other compns. Samples with  $\text{K}_2\text{O}$  addns. do not show the presence of cristobalite. It is thus shown that addns. of  $\text{Li}_2\text{O}$ ,  $\text{Na}_2\text{O}$ , and  $\text{K}_2\text{O}$  have a marked effect on the mullitization process, by decreasing the temp. of formation of mullite and by somewhat increasing its content. It is thus con-

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cluded from the expts. performed that the influence of the alkali oxides on phase transformations during firing of clays depends on the mineralogical compn. of the latter. The effect of alkali oxides on the formation process of cristobalite during the firing of kaolinite clays decreases in the following order:  $\text{Li}_2\text{O} > \text{Na}_2\text{O} > \text{K}_2\text{O}$ . The same order is observed with respect to mullitization.

S. A. Mersol

19930271



USSR

UDC 666.3.022.64

PAVLOV, V. F. (Candidate of Technical Sciences), BYSTRIKOV, A. S. (Candidate of Technical Sciences), and ANDREYEVA, N. I. (Engineer), NIISTroykeramika

"Effect of Impurities  $Li_2O$ ,  $Na_2O$  and  $K_2O$  on Phase Transformations. During Firing of Clays of Different Mineralogical Composition"

Moscow, Steklo i Keramika, No 2, Feb 70, pp 38-40

Abstract: The article presents results of an investigation of the effect of alkali oxides on phase transformations during firing of clays of different mineralogical composition. The clays were of the following mineralogical composition: kamenskaya -- kaolinite; vladimirovskaya -- montmorillonite-kaolinite; tselinogradskaya -- kaolinite-hydromica. Impurities were introduced in the form of carbonates in 2% quantities converted to oxides. The impurities were thoroughly mixed with clay. Specimens in the form of disks 18 mm in diameter and 4-5 mm thick were formed from the prepared mixtures. The specimens were fired in a shielded silit (silicon carbide) furnace at the temperature 1050-1300° and they are cooled together with the furnace. It is shown that the cristobalitizing and mullitizing action of the impurities depends on the mineralogical composition of the clays. It is established that with the increase in the weight and radius of cation its cristobalitizing action decreases. The alkali cations have similar effect on the process of mullitization.

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1/2 030

UNCLASSIFIED

PROCESSING DATE--20NOV70

TITLE--THE INFLUENCE OF THE FACTOR OF DYNAMIC NONSHARPNESS ON THE  
SCANOGRAPHIC INFORMATION -U-

AUTHOR--(04)-ZUBOVSKIY, G.A., PAVLOV, V.G., FOKHT, A.S., KASATKIN, YU.N.

COUNTRY OF INFO--USSR

SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 6, PP 41-49

DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RADIOGRAPHY, LIVER, LUNG, HEART, IMAGE CONTRAST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1025

STEP NO--UR/0241/70/015/006/0041/0049

CIRC ACCESSION NO--AP0130060

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--20NOV70

2/2 C30

CIRC ACCESSION NO--A0130030

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS DISCUSS THE INFLUENCE OF THE FACTOR OF DYNAMIC NONSHARPNESS, WHICH OCCURS DURING SCANNING OF THE LIVER, LUNGS AND HEART IN THE PROCESS OF THEIR INVESTIGATION OF THE ACCURACY OF THE IMAGE OBTAINED. IT WAS FOUND THAT THE REFERRED TO FACTOR DECREASES THE RESOLVING CAPACITY OF SCANNING AND STATISTICAL SIGNIFICANCE OF REGISTRATION. METHODS OF CORRECTING THIS FACTORS ARE PROPOSED. BEST RESULTS WERE OBTAINED WITH THE USE OF A GAMMACHAMBER, PROVIDED THE DURATION OF EXPOSITION IS NOT OVER THE TIME OF POSSIBLE BREATHING RETENTION, I. E. NOT MORE THAN 30 SECONDS. FACILITY: MOSKOVSKIY NAUCHNO-ISSLED. RENTGENO-RADIOLOGICHESKIY INSTITUT MZ RSFSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--CALCULATION AND EVALUATION OF THE PROPERTIES OF FOCUSING  
COLLIMATORS -U-  
AUTHOR-(03)-PAVLOV, V.G., FOKHT, A.S., ZUBOVSKIY, G.A.  
COUNTRY OF INFO--USSR  
SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 6. PP 78-82  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--COLLIMATOR, DIAGNOSTIC EQUIPMENT, RADIOACTIVITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3002/1513 STEP NO--UR/0241/70/015/006/0078/0082  
CIRC ACCESSION NO--AP0128908  
UNCLASSIFIED

2/2 017  
CIRC ACCESSION NO--AP0128908 UNCLASSIFIED PROCESSING DATE--13NOV70  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS PROPOSE A METHOD OF  
CALCULATION AND QUANTITATIVE EVALUATION OF FOCUSING COLLIMATORS.  
CALCULATIONS OF THE REALATION BETWEEN FOCUS CONTRASTNESS AND ITS DEPTH  
ARE GIVEN. THE CALCULATION DATA WERE COMPARED WITH EXPERIMENTAL ONES.  
THE ERROR IN CALCULATION OF THE FOCUS CONTRASTNESS MAY REACH 15PERCENT.  
THE REFERRED TO TECHNIQUE IS PROPOSED FOR RADIOLOGIC INVESTIGATIONS.  
FACILITY: MUSKOVSKIY NAUCHNO-ISSLED.  
RENTGENO-RADIOLOGICHESKIY INSTITUT MZ RSFSR.

UNCLASSIFIED

USSR

UDC 531.01

PAVLOV, V. G.

"Utilization of the Concept of the Infinitesimal Transformation in Studying the Sensitivity of Linear Dynamic Systems"

Tr. Kazan. aviats. in-ta (Works of the Kazan' Aviation Institute), 1972, vyp. 149, pp 35-39 (from RZh--Mekhanika, No 6, Jun 7; Abstract No 6A87)

Translation: The new method of studying the sensitivity of linear systems to variations of their parameters is proposed, the basic idea of which consists in the fact that the rated solution is imbedded in a set of solutions, the closeness of which is determined by the possibility of considering them as the result of infinitesimal transformations. It is demonstrated that the problem of studying the sensitivity of linear systems to variations of parameters reduces to the problem of constructing a group of continuous transformations of the phase space and a group of continuous transformations of the parameter space if we consider the altered systems and the rated system similar in the sense of closeness according to S. Lie. The bibliography has 5 entries.

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USSR

UDC 62-50

PAVLOV, V. G.

"Group Properties and Invariant Solutions of Bellman Equations in the Problem of Synthesis of Second Order Optimal Control Systems"

Kazan', Aviatsionnaya Tekhnika, No 4, 1972, pp 21-27

Abstract: In dealing with the problem of synthesizing second order optimal control systems, group properties were studied and sets of invariant solutions of the Bellman equations were found. An equation which realizes the movements of the system and minimizes the control functions was set up. A group was then constructed, permitting Bellman equations and determined by Lee algebra, whose infinitesimal operator coordinates did not depend on the set of functions determining the functional and the right side of the system equation. The invariant partial solutions of the Bellman equations were constructed in correspondence with the basic operators found previously. As an example, the use of these results for the synthesis of optimal roll control of flight vehicles was illustrated, and an exact solution was obtained.

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USSR

UDC: 621.376.4(088.8)

ZHENEVSKIY, Yu. P., MUSAYELIAN, S. A., NEVDYAYEV, L. M., and  
PAVLOV, V. G.

"Second-Generation Device for Demodulating Signals with Pulse-Phase  
Modulation"

Avt. sv. SSSR (Author's Certificate USSR) Class 21a<sup>4</sup>, 42; 21a<sup>1</sup>,  
36/08, (H 03 d 3/24, H 03K 9/04), No. 275170, Application 12.07.68,  
Publication 12.10.70 (from RZh-Radiotekhnika, No. 3, March 71,  
Abstract No. 3D94P)

Translation: A device is proposed, which contains a sawtooth volt-  
age oscillator connected to a signal source, a switching circuit  
with a memory element controlling a source of synchronization, an  
interpolator, a low-frequency filter, for example, a trigger, and  
a delay line. To reduce the noise at the communication channel  
output caused by the random lost operating pulses at the input of  
the device, the synchronization source is connected to the switch-  
ing circuit through a coincidence network connected through the  
control input to the trigger, the switching input of which is di-  
rectly connected to the signal source while the input of the  
counter is connected through the delay line to the synchronization  
source.

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USSR

UDC 619:616.988.43-084.47

SYUSYUKIN, A. A., KRAVETS, I. K., TSVETKOVA, N. Ye., and PAVLOV, V. G.,  
All-Union Scientific Research Institute of Food-and-Mouth Disease

"Immunogenic Properties of an Experimental Food-and-Mouth Disease Vaccine

Moscow, Veterinariya, No 5, May 71, pp 40-42

Abstract: The results of a study of the immunogenic character of an inactivated vaccine prepared from foot-and-mouth disease virus A<sub>22</sub>, strain 003, grown in BNK cells, are reported. Virus from the 6-7th and 102-103 passages was used in the form of a centrifuged cultural liquid. The vaccine used consisted of virus (50%), a 6% solution of aluminum hydroxide (40%), and glycerine (10%). After adsorption of the virus, the pH of the mixture was adjusted with glycine buffer to 8.6-8.8, and formalin was added at a final concentration of 0.05%. The virus was inactivated for 48 hrs at 25°C. After the inactivation, glycerin was added, and in some series, saponin. The vaccine was tested in cattle and guinea pigs. It was found that all six test vaccines had high immunogenic properties. In five test vaccines, the ID<sub>50</sub> for guinea pigs was 0.15-0.19 ml, and only in one test vaccine was it 0.26 ml. Inactivated vaccines with saponin (2.5 mg per 10 ml vaccine) from virus of the 0th and 102d passages grown from a single-layer cell culture under stationary

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USSR

SYUSYUKIN, A. A., et al, Veterinariya, No 5, May 71, pp 40-42

conditions was tested on guinea pigs. The vaccine from virus of the 6th passage was three times more effective than that from virus of the 102d passage. The LD<sub>50</sub> in the first case was 0.25 ml, that in the second case was 0.76 ml. In general, it was found that vaccine from virus of the earlier passages is more immunogenic than vaccine from virus of later passages.

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USSR

UDC: 621.376.4.621.376.55

ZHENEVSKIY, Yu. P., MUSAYELIAN, S. A., NEVDYAYEV, L. M., PAYLOV, V. G.

"A Device for Demodulating Signals With Pulse Position Modulation of the Second Kind"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 22, 1970, Soviet Patent No 275170, Class 21, filed 12 Jul 68, p 42

Abstract: This Author's Certificate introduces a device for demodulating signals with pulse position modulation of the second kind. The unit contains a sawtooth voltage generator connected to the signal source, a keying circuit with memory element controlled by a synchronization source, an interpolator, e. g. a low-frequency filter, a flip-flop, and a delay line. As a distinguishing feature of the patent, the device is designed for reduction of noises at the output of the communication channel caused by random disappearances of working pulses at the input of the device. The synchronization source is connected to the keying circuit through a coincidence gate whose control input is connected to the flip-flop, the trigger input of the flip-flop being connected directly to the signal source. The counting input of the flip-flop is connected through the delay line to the synchronization source.

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USSR

UDC: 621.374.5(088.8)

BOTVINNIK, A. Ye., PAVLOV, V. G., Moscow Electrical Engineering Institute  
of Communications

"A Device for Regulating the Transmission Ratio of Continuous Signals"

USSR Author's Certificate No 262189, filed 18 Oct 68, published 27 May 70  
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 16247 P)

Translation: This Author's Certificate introduces a device for regulating the transmission ratio of continuous signals. The device contains a controlled element and a threshold element. To improve control of continuous signals while simultaneously simplifying the device, a network made up of a slave pulse oscillator, a resettable counter and a flip-flop connected in series is connected between the output of the threshold element and the controlling element of the controlled circuit. The controlling inputs of the counter and flip-flop are connected to the output of the reset pulse oscillator.

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USSR

UDC 533.652/.661.013

PAVLOV, V. G.

"Equivalent Natural Longitudinal Motions of an Aircraft"

Tr. Kazan. aviats. in-ta (Transactions of the Kazan' Aviation Institute),  
Vypusk (Issue) 119, 1970, pp 63-69 (from RZh-Mekhanika, No 12, Dec 70,  
Abstract No 12B349, by G. S. Aronin)

Translation: Based on known methods of studying linear dynamic systems by using group theory, equivalent natural longitudinal perturbed motions are examined and the conditions of their existence are established. Equivalence is defined as the coincidence of trajectories in space with phase coordinates: "velocity -- angle of attack -- angle of pitching" with an accuracy to the nonsingular linear transformation. Linearized homogeneous differential equations of longitudinal motion with constant coefficients are described in the ordinary dimensionless form. A particular case of a finite continuous group of linear transformations is examined. Expressions are derived for coefficients of a system of differential equations of equivalent natural motions of an aircraft.

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1/2 024  
TITLE--FRICTION AND EFFICIENCY OF GEARS IN A VACUUM -U-  
AUTHOR--(02)-DROZDOV, YU.N., PAVLOV, V.G.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 2, 1970, PP 7-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--GEAR, MATHEMATIC EXPRESSION, FRICTION COEFFICIENT, MODEL,  
VACUUM TECHNOLOGY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3003/1880  
CIRC ACCESSION NO---AP0130707  
UNCLASSIFIED  
PROCESSING DATE--04DEC70  
STEP NO--UR/0122/70/000/002/0007/0009

2/2 024

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130707

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FRICTION CHARACTERISTICS OF SOLID BODIES IN A VACUUM ARE DEMONSTRATED. FORMULAS ARE GIVEN FOR CALCULATING THE EFFICIENCY OF DRY GEARS. THE COEFFICIENTS OF FRICTION FOR THE GEAR MATERIALS WERE DETERMINED ON A VACUUM ROLLER STAND. FRICTION IN GEARING CONTACT IS STUDIED USING DIMENSIONAL ANALYSIS. THIS MAKES IT POSSIBLE TO DETERMINE THE RELATIONSHIPS BETWEEN THE RELATIVE PARAMETERS OF THE ROLLER MODEL AND A FULL SCALE UNIT. FULFILLMENT OF THESE RELATIONSHIPS ON THE MODEL MAKES IT POSSIBLE TO USE EXPERIMENTAL RESULTS IN CALCULATING GEAR EFFICIENCY.

UNCLASSIFIED

P  
USSR

UDC 621.373.53(088.8)

MUSAYELYAN, S. A., MAZURENKO, I. V., SHARYAPOV, Sh. A., PAVLOV, V. G.

"A Relaxation Oscillator"

USSR Author's Certificate No 259141, Filed 7 Aug 68, Published 28 Apr 70 (from  
RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10G170 P)

Translation: A relaxation oscillator is proposed with pulse bridge elements connected in the collector-base circuits of the transistors in the oscillator. To provide conditions for easy self-excitation of the oscillator and improve operational stability, a dynamic control circuit is connected between one of the poles of the power supply and the common bus. This control circuit is made up of a resistor and capacitor connected in series, the common point being connected to the bases of the transistors in the oscillator through auxiliary resistors, and to the collectors of these same transistors through semiconductor diodes. To improve the operational reliability of the oscillator on low frequencies, the additional resistors are connected to the capacitor through an emitter follower.

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USSR

PAVLOV, V. G.

"Sliding Friction During Rolling with Sliding of Bodies in a Vacuum"

Sb. Nauch. tr. Perm. Politekhn. In-t. [Collected Scientific Works of Perm' Polytechnical Institute], 1971, No 102, pp 38-42, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 A78, by V. A. Samsonov).

Translation: An experimental installation is described for investigation of friction during rolling of bodies with sliding (friction transmission in a vacuum. The parameters of the installation are: vacuum in operating chamber  $10^{-8}$  mm h.g., maximum torque 5 kgm, pressing force on rollers up to 200 kg, sliding velocity up to 680 cm/sec. The installation was used to determine the coefficient of friction of certain materials. The limits of the coefficient of sliding friction were determined: for iron (with glass) 0.1-0.4,  $\text{Fe}(\text{CaF}_2)$  0.27-0.43, etc. Qualitative information are presented on the behavior of the coefficient of friction with increasing velocity and normal pressure for various materials.

1/1

USSR

UDC 532.5

KRASIL'NIKOV, V. A., PAVLOV, V. I.

"Relaxation of Gravity Waves Resulting from Interaction with Capillary Waves"

Vestn. Mosk. Un-ta. Fiz., Astron. [Moscow University Herald, Physics, Astronomy], Vol 13, No 2, 1972, pp 235-237, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 B470 by Yu. L. Vorob'yev).

Translation: The influence of surface tension on the process of propagation of gravity waves is studied. Assuming that the number of interacting gravity and capillary waves is high, a statistical approach is used. If the non-linearity is not too great, the influence of the high frequency portion of the spectrum on the low frequency portion is negligible, and in this case expressions are produced for the full energy and amplitudes of the perturbed surface of the liquid. A formula is produced for determination of the relaxation time of the gravity wave and numerical estimates are made, the results of which are quite similar to the observed values. 6 Biblio. Refs.

1/1

Acc. Nr:

AP0052525

Abstracting Service:

CHEMICAL ABST. 5-70

Ref. Code:

4R0459

101186g Effect of thermal pretreatment and crystallization conditions on structure formation in linear polyurethane. Pavlov, V. L.; Lipatov, Yu. S. (Inst. Khim. Vysokomol. Soedin., Kiev, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 89-94 (Russ). The size of polyurethane (I) spherulites increased with the temp. and time of I melt heating prior to crystn. High melt temps. decreased the crystn. rates. Heating I based on diethylene glycol and hexamethylene diisocyanate  $\leq 170^\circ$  failed to dissolve small fragments of I. Above  $170^\circ$  I melts contained only mol. aggregates. The spherulite growth rates from I melts heated below or above  $170^\circ$  were different. CPJR

90.

REEL/FRA

19821168

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--DETERMINATION OF LIQUID HOLDUP ON SIEVE PLATES WITH PROTECTED  
OVERFLOW -U-  
AUTHOR--(02)-PAVLOV, V.P., TRUBKIN, V.YE.  
COUNTRY OF INFO--USSR  
SOURCE--KHIM. PROM. (MOSCOW) 1970, 46(3), 217-19  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--MASS TRANSFER, CHEMICAL PLANT EQUIPMENT, TWO PHASE FLOW,  
HYDRAULIC RESISTANCE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1996/1495 STEP NO--UR/0064/70/046/003/0217/0219  
CIRC ACCESSION NO--AP0118482  
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0118482

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE HEIGHT  $H_{SUBC}$  OF LIQ. ON SIEVE PLATES WITH PROTECTED OVERFLOW (IN MASS TRANSFER COLUMNS) INCREASED WITH INCREASING L-G RATIO (WHERE L AND G ARE THE FLOW RATE OF LIQ. AND GAS IN THE COLUMN, IN M PRIME<sup>3</sup>-HR), WITH INCREASING HEIGHT OF THE OVERFLOW BAFFLE ( $H_{SUBB}$ ) AND WITH DECREASING GAP OF THE OVERFLOW OPENING (S); FOR INSTANCE, IN THE CASE OF WATER AIR FLOWS, THE VALUE OF  $H_{SUBC}$  RANGED FROM 11 TO 82 MM FOR (L-G) TIMES 10 PRIME NEGATIVE<sup>4</sup> BETWEEN 10 AND 70,  $H_{SUBB}$  BETWEEN 20 AND 80 MM, AND S BETWEEN 15 AND 35 MM. EMPIRICAL EQUATIONS FOR THE MEAN GAS CONTENT OF THE LIQ. IN THE SLIT AND FOR THE RESISTANCE COEFF. OF THE SLIT ARE PRESENTED.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--GAUGE INVARIANCE AND REGULARIZATION -U-  
AUTHOR-(03)-MEDVEDYEV, B.V., PAVLOV, V.P., SUKHANOV, A.D.  
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 6, PP 2099-2109  
DATE PUBLISHED--70

SUBJECT AREAS--MATHEMATICAL SCIENCES

TOPIC TAGS--PAULI EXCLUSION PRINCIPLE, PERTURBATION THEORY, INTEGRAL  
FUNCTION, INTEGRAL CALCULUS

CENTRAL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1998/0534

STEP NO--UR/0056/70/058/006/2099/2109

CIRC ACCESSION NO--AP0121206

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0121206

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT PAULI-WILLIAMS  
REGULARIZATION REQUIRED FOR CONSERVATION OF GAUGE INVARIANCE AT ALL  
CALCULATION STAGES IN PERTURBATION THEORY POSSESSES SOME SINGULAR  
PROPERTIES. THUS INTEGRALS OF POSITIVELY DEFINITE FUNCTIONS,  
CONVERGING AS WELL AS DIVERGING, ARE MADE TO VANISH; MOREOVER IT LEADS  
TO DISCONTINUITIES IN THE REGULAR PARTS OF DIVERGING DIAGRAM. THE  
PHYSICAL MEANING OF THE PAULI-WILLIAMS PROCEDURE IS DISCUSSED, AND THE  
POSSIBILITY OF EXTENDING THE PROCEDURE IN SUCH A WAY AS TO MAKE THE  
DIVERGENT PARTS OF ALL DIAGRAMS VANISH IS DISCUSSED. FACILITY:  
MATEMATICHESKIY INSTITUT IM. STEKLOVA AN SSSR.

UNCLASSIFIED

1/2 006 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--GAUGE INVARIANCE AND REGULARIZATION -U-  
AUTHOR--(03)-MEDVEDEV, B.V., PAVLOV, V.P., SUKHANOV, A.D.  
COUNTRY OF INFO--USSR  
SOURCE--ITF 70 15 CONF 691035 7. DEP. CFSTI FROM CONFERENCE ON HIGH ENERGY  
PHYSICS AND THEORY OF ELEMENTARY PARTICLES, KIEV, USSR  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--PERTUBATION METHOD, ACCURACY STANDARD, CONVERGENT SERIES  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3001/1582 STEP NO--UR/0000/70/000/000/0019/0019  
CIRC ACCESSION NO--AT0127078  
UNCLASSIFIED



UNCLASSIFIED

PROCESSING DATE--27NOV70

2/2 006

CIRC ACCESSION NO--ATO127078

ABSTRACT/EXTRACT--(U) GP-0--

ABSTRACT. IT IS SHOWN THAT PAULI VILLARS  
REGULARIZATION, IN WHICH ONE NEEDS TO PRESERVE THE GAUGE INVARIANCE AT  
ALL THE STAGES OF THE PERTURBATIVE CALCULATIONS, HAS THE UNUSUAL  
PROPERTIES. THE VALUES OF THE CONVERGENT INTEGRALS OF POSITIVE DEFINITE  
FUNCTIONS AS WELL AS OF DIVERGENT ONES VANISH UNDER THIS REGULARIZATION,  
AND THE DISCONTINUITIES ARISE IN THE REGULAR PARTS OF DIVERGENT GRAPHS.  
THE PHYSICAL SENSE OF PAULI VILLARS PROCEDURE AND POSSIBILITY OF  
VANISHING OF DIVERGENT PARTS OF ALL THE GRAPHS ARE DISCUSSED.  
FACILITY: AKADEMIYA NAUK UKRAINSKOI SSR, KIEV. INSTITUT TEORETICHESKOI  
FIZIKI.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--27NOV70

1/2 019

TITLE--ON THE HAMILTONIAN FORMULATION OF THE QUANTUM ELECTRODYNAMICS WITH  
GAUGE NON INVARIANT REGULARIZATION -U-

AUTHOR-(02)-PAVLOV, V.P., SUKHANOV, A.D.

COUNTRY OF INFO--USSR

SOURCE--(ITF,70,16) (CONF,691035,8). DEP. CFSTI FROM CONFERENCE ON HIGH  
ENERGY PHYSICS AND THEORY OF ELEMENTARY PARTICLES, KIEV, USSR

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--HAMILTONIAN, QUANTUM ELECTRODYNAMICS, SPINOR, ELECTROMAGNETIC  
FIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3001/1583

STEP NO--UR/0000/70/000/000/0009/0009

CIRC ACCESSION NO--AT0127079

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0127079

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTERACTION HAMILTONIAN IN THE INTERACTION REPRESENTATION IS CONSTRUCTED FOR QUANTUM ELECTRODYNAMICS WITHIN THE SECOND ORDER IN CHARGE IN THE GAUGE NONINVARIANT REGULARIZATION CASE, WHEN ONE NEEDS TO TAKE INTO ACCOUNT THE PHOTON MASS RENORMALIZATION COUNTER TERM. IT IS SHOWN, THAT ONE MAY NOT CONFINE ONESELF TO WICK THEOREM WITH ONLY PAIR CONCENTRATIONS OF THE SPINOR FIELDS IN THIS CASE, THERE IS AN ADDITIONAL NONCOVARIANT TERM IN THE HAMILTONIAN, WHICH CORRESPONDS TO THE DIFFERENCE BETWEEN THE WICK AND DYSON TAU PRODUCTS OF ELECTROMAGNETIC CURRENTS; THIS DIFFERENCE DOES NOT VANISH UNDER GAUGE NONINVARIANT REGULARIZATION. FACILITY: AKADEMIYA NAUK UKRAINSKOI SSR, KIEV. INSTITUT TEORETICHESKOI FIZIKI.

UNCLASSIFIED

1/2 018  
TITLE--SCALAR ELECTRODYNAMICS AND NEUTRAL VECTOR FIELD THEORY IN THE  
DISPERSION APPROACH -U-  
AUTHOR--(03)-PAVLOV, V.P., SVECHNIKOV, S.V., SUKHANOV, A.D.  
COUNTRY OF INFO--USSR  
SOURCE--TEORETICHESKAYA I MATEMATICHESKAYA FIZIKA, 1970, VOL 3, NK 1, PP  
57-71  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--ELECTRODYNAMICS, VECTOR FUNCTION, WAVE FUNCTION, DISPERSION  
EQUATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3003/1018  
ACCESSION NO--AP0130053  
UNCLASSIFIED  
PROCESSING DATE--13NOV70  
STEP NO--UR/0646/70/003/001/0057/0071

2/2 018

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0130053

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT.

THE DYNAMICAL APPARATUS OF DISPERSION APPROACH IS APPLIED SUCCESSIVELY TO THE SCALAR ELECTRODYNAMICS AND THE THEORY OF MASSIVE NEUTRAL VECTOR FIELD. THE EFFECTS OF WAVE FUNCTION RENORMALIZATION AND THEIR INFLUENCE UPON THE HEISENBERG CURRENT HERMICITY ARE TAKEN INTO ACCOUNT. THE HIGHER CURRENT LIKE OPERATORS ARE FOUND AND THE EQUAL TIME COMMUTATORS OF HEISENBERG FIELDS AND CURRENTS ARE CONSTRUCTED. THE RESULTS OBTAINED ARE IN FULL ACCORDANCE WITH THE SPECTRAL REPRESENTATION CONSEQUENCES WHEN USING THE GAUGE INVARIANCE REQUIREMENT AT ALL STAGES. FACILITY:

UNCLASSIFIED

USSR

UDC: 534.2

MERKULOVA, V. M., PAVLOV, V. S.

"Variation of Absorption of Sound in Some Rocks up to 400°C as a Function of Temperature"

Tr. Taganrog. radiotekhn. in-ta (Works of Taganrog Radio Engineering Institute), 1973, vyp. 34, pp 131-145 (from RZh-Fizika, No 5, May 73, abstract No 5Zh566 by V. I. Uchastkin)

Translation: A torsional pendulum on a frequency of about one hertz is used to study the internal friction (with accuracy of temperature control within  $\pm 1^\circ\text{C}$ ) in granite-gneiss, metamorphic shale, and quartzite as a function of temperature. It is noted that specimens made in the form of prismatic bars were washed and dried in a vacuum at  $80^\circ\text{C}$  before testing. The paper gives the content of impurities in quartz and obsidian checked by a spectral method. It is shown that with heating above  $100^\circ\text{C}$  internal friction decreases, repeated measurement showing a depression in the initial level. It is noted that for quartzite heated to  $400^\circ\text{C}$  the internal friction showed almost no change in the repeat cycle of measurements. Obsidian shows a broad temperature maximum of internal friction which is independent of the cycle of measurements. It is pointed out that the irreversible change of internal friction with temperature in crystalline rocks is due to release of the liquid phase from the pores and  $1/2$

USSR

MERKULOVA, M. V., PAVLOV, V. S., Tr. Taganrog. radiotekhn. in-ta, 1973,  
vyp. 34, pp 131-145

microcracks during heating. It is found that the residual internal friction after heating of specimens to 300-400°C may be due to processes of structural or dislocational relaxation under shear strains. It is shown that the maximum of internal friction in obsidian is caused by diffusion losses -- with the principal contribution from ions of alkali earth elements, especially sodium.

2/2

Single Crystals

USSR

UDC 548.522

PAVLOV, V. S., MOCHALOV, M. M., and VORONTSOV, YE. S., Voronezh Polytechnic Institute

"Growing of  $\text{Fe}_3\text{O}_4$  and  $\text{CoO}$  Crystals in a d-c Electric Arc"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 3, 1973, pp 49-52

Abstract: Single crystals of  $\text{Fe}_3\text{O}_4$  and  $\text{CoO}$  were grown in a hermetic chamber with controllable atmosphere by substance transfer from the cathode to the anode of the d-c electric arc. The grown crystals were up to 80 mm long and up to 10 mm in diameter. The temperature and the spectrum of the arc, effects of growing conditions and of the electrode spacing on the substance transfer, and also the behavior of the zero electrode were investigated. Phase analysis indicates that in case of  $\text{Fe}_3\text{O}_4$  sublimation, single crystals of nonstoichiometric  $\text{Fe}_3\text{O}_4$  spinel develop on the anode, but a crystal of cubic structure grows, when using  $\text{CoO}$  in the capacity of electrodes. The mechanism of substance transfer is discussed by taking into account thermodynamic factors and the directed motion of charged particles, including electrons. The process of sublimation and condensation of substance in an electric arc can be transformed into a peculiar drawing of the crystal from the gaseous medium through the liquid phase. In this case, the high temperature and control of the growing rate and atmospheric pressure can be considered as con-

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USSR

PAVLOV, V. S., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 3, 1973, pp 49-52

tributary factors for obtaining a single crystal substance. Three figures, three formulas, four bibliographic references.

2/2

- 34 -

USSR

UDC 537.226.33:534.286

POSTNIKOV, V. S., KAVERIN, L. D., ~~PAVLOV, V. S.~~, and TURKOV, S. K.

"Internal Friction in Single Crystals of Lithium Niobate at Hertz Frequencies"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 9,  
Sep 71, pp 1918-1920

Abstract: The authors cite the results of investigating low-frequency internal friction and shift modulus of monocrystalline  $\text{LiNbO}_3$  in the temperature range of 4.2-400° K. They found two relaxation peaks at temperatures of 300° K (peak A) and 130° K (peak B) on the temperature curve of the internal friction of polydomain samples. The A peak does not exist in the monodomain samples. The activation energy of peaks A and B is 0.7 and 0.14 eV respectively. The authors conclude that peak B is the result of point defects generated in the annealing process. Peak A is explained by the interaction of point defects with 180°-domain boundaries. The experimental results agree quite well with the theoretical ones. The authors use three graphs to illustrate their findings. The article contains 3 illustrations and 5 bibliographic entries.

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